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AMMUNITION BULLETIN No 27

FOR INSPECTING ORDNANCE OFFICERS

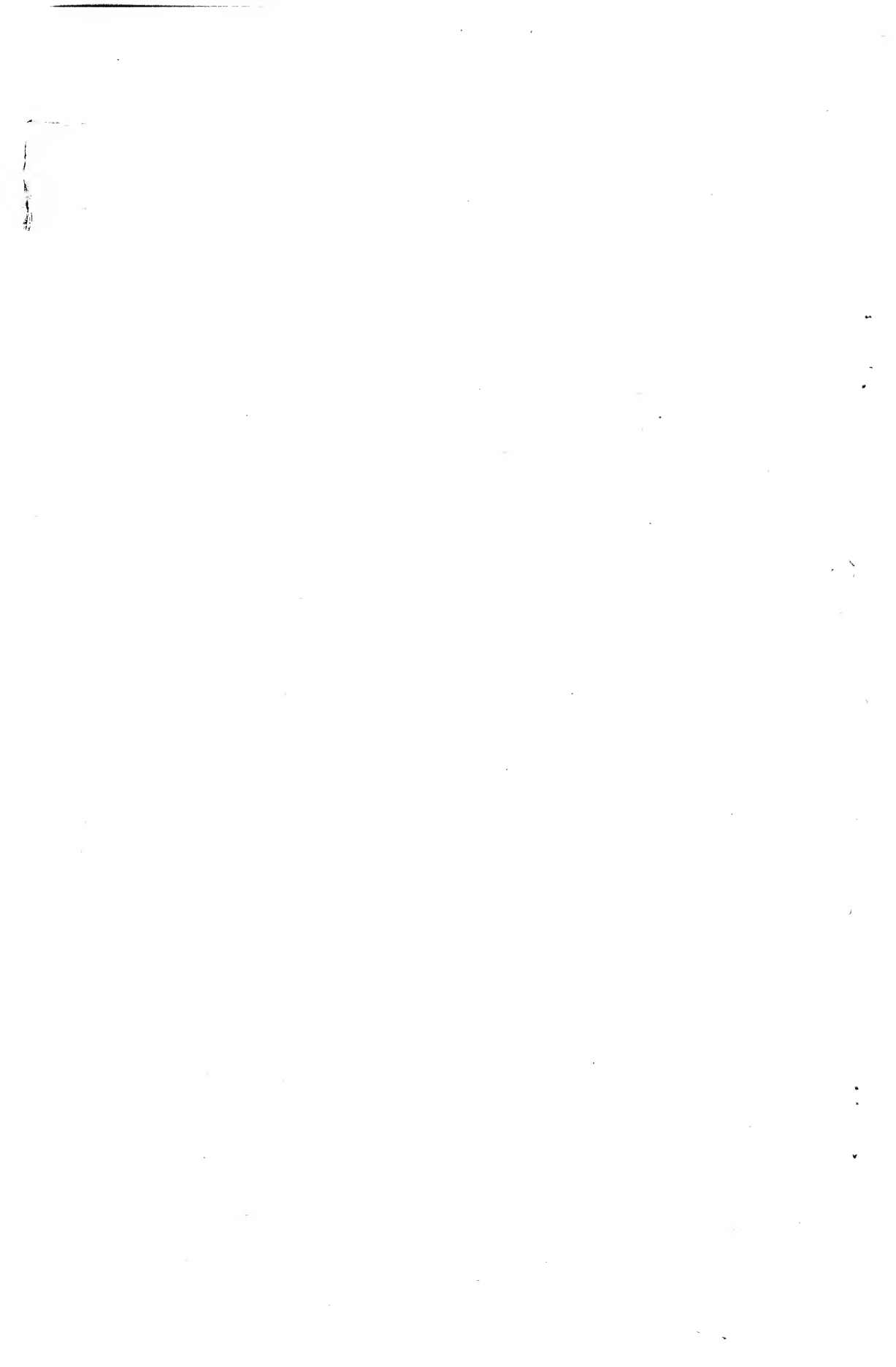
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CHIEF INSPECTOR OF ARMAMENTS,
WOOLWICH, S. E. 18.



SECURITY.

AMMUNITION BULLETIN NO.27
for
INSPECTING ORDNANCE OFFICERS
and
A. A. AMMUNITION OFFICERS.

ISSUED BY :-

CHIEF INSPECTOR OF ARMAMENTS,

WOOLWICH.

May, 1942.

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ENEMY AMMUNITION.

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467. AMERICAN TERMS USED IN CONNECTION WITH AMMUNITION.

The following is a list of terms used in American publications in connection with ammunition. The terms, many of which are self explanatory, are arranged in alphabetical order under the following sub-headings:-
General, cartridges, fuzes and gaines, primers and tubes, and lastly, projectiles.

American Terms etc.	Explanation or British equivalent terms etc.
<u>GENERAL.</u>	
Black Powder.	Gunpowder.
Chemical fillings.	Includes gas, smoke and incendiary.
Designation.	Nomenclature.
Drawing number.	Design number.
Explosive D.	Ammonium Picrate.
E.C. blank fire.	An explosive consisting of gun cotton and nitrates.
Firing table.	Range table.
Harassing chemical (gas).	Chemical.
Loader.	Filler.
Loading assembly.	Method of filling.
M.2.	Mark II.
M. '17.	1917 Model (Year of Design).
Obscuring chemical.	Smoke (non-toxic).
Quantity distance.	Safety distance. (Storage).
S.C.G. (Sea Coast Gun).	Coast Artillery Gun.
Smokeless Powder.	Propellant.
Tetryl.	C.E.
Tridite.	Picric acid and dinitrophenol.
<u>CARTRIDGES.</u>	
Ammunition lot.	Ammunition containing one lot of propellant and normally one lot of all components (similar to Batching System).
Artillery ammunition data card.	Similar to Batch label.
Base and increment type.	Full charge consisting of a base section and one or more smaller increments. The increments may be of uniform size or vary.
Bundle Packing.	Fibre cylindrical containers secured in clamping device for transport.
C.S.C. (Cartridge Storage Case).	B.L. cartridge cylinder.
Equal type, multi-section, propelling charge.	Full charge consisting of fractional charges. The fractional charges all being of equal weight.
Fixed ammunition.	Fixed Q.F. Ammunition.
Igniter (or Primer) protector cap.	Igniter cover.
Nitroglycerine powders.	Propellants containing nitrocellulose and nitroglycerine.
Propelling Charges.	Cartridge.
Separate loading bag cartridge.	B.L. cartridge.
Separate loading - brass cartridge case.	Separate Q.F. cartridge.
Semi-fixed ammunition.	Q.F. round with detachable case.
Single section propelling charge.	Cartridge in one charge.
Unequal related type, multi-section, propelling charge.	Cartridge consisting of sections or fractions of unequal weight, e.g. howitzer cartridges or a gun cartridge consisting of, say $\frac{1}{3}$ and $\frac{2}{3}$ fractional charges.
Zone 3.	Charge 3.

American Terms etc.	Explanation or British equivalent terms etc.
<u>FUZES & GAINES.</u>	
B.D. (Base Detonating) fuze.	Base fuze of the detonating type.
B.P. (Base Percussion) fuze.	Base fuze of the igniferous type.
Booster.	Gainé.
Combination fuze.	Time and percussion fuze with graze action.
Concussion primer.	Time detonator in T or T. and P. fuzes.
Interrupter.	Centrifugal safety bolt.
L.D.	Long delay.
N.D.	Non delay.
Point.	Nose of shell.
P.D. (point detonating) fuze.	Nose fuze, filled H.E. or used in conjunction with a gainé.
Percussion primer.	Percussion detonator.
Rotor.	Shutter.
S.D.	Short delay.
S.Q. (Super quick) fuze.	Direct action.
T.S.Q. (Time and super quick) fuze.	Time and percussion with direct action.
<u>PRIMERS Q.F. CTGE. AND TUBES.</u>	
Battery cup (Percussion primer)	Striker holder.
Battery plug (percussion primer)	Striker.
Combination percussion-electric primer.	Electric and percussion tube.
Electric primer.	Electric tube.
Friction primer.	Friction tube.
Primers, percussion, 20 grs., 49 grs., 75 grs., 100 grs., 150 grs., and 300 grains.	Primers percussion Q.F. cartridge.
Primer, percussion, 21 grains.	Percussion tube.
<u>PROJECTILES.</u>	
Adapter plug.	Closing plug used in fuze-hole adapter.
Armour piercing cap.	Penetrative cap.
Base cover.	Base plate (H.E. shell).
Boat-tailed.	Streamlined.
Bourrelet.	Front band (formed below shoulder of projectile).
Common steel shell.	H.E. shell.
Fuze-well cup.	Exploder or burster container.
Low explosive shell.	Shell filled gunpowder (including shrapnel).
Rotating band.	Driving band.
Square base projectile.	Cylindrical base (or plain base) projectile.
Target projectiles.	Practice projectiles.
Weight zone marking.	Unit system of weight marking.
Windshield.	Ballistic cap.

468. SHELL, B.L., H.E., M.101 AND CARTRIDGE 32.25-LB. N.H. FOR 155 MM. GUN.

1. The complete round for this American B.L. gun consists of the following components:-

Tube percussion	-	Primer percussion 21 grains Mark IIA1.
Cartridge, B.L.	-	Charge, propelling, 32.25-lb., N.H., type B & 1.
Shell, H.E.	-	M.101 filled T.N.T., Amatol or Trimonite.
Booster	-	M.21.
Fuze	-	Point, detonating, M.51.
Plug fuze-hole	-	Plug, lifting, type "G".

2. Primer, Booster and Fuze.

Details of these components and references to their packages are given in Items 469, 470 and 471 respectively.

3. Propelling Charge. (Fig.174)

(a) The propellant charge consists of approximately 32.25 lb. of N.H. or F.N.H. Powder and is of the "Base and Increment" type, i.e. a base section and a smaller section forming an increment. These are secured by means of ties to form a full charge. The base section can be used alone as a reduced charge. The overall length of the complete cartridge is 37.4 inches and the diameter 6.5 inches.

(b) The base section consists of approximately 22 lb. of N.H. Powder in a cylindrical bag made from silk, wool or mohair material.

An igniter, made from closely woven red silk and containing 10 oz. of "Army Black Powder, Grade A1" closes the rear end of the section. The igniter is stitched to form a central circular pocket for the gunpowder. The cartridge bag has four strips sewn at the front end for the attachment of the increment section and is made firm and compact by a strip of silk cloth which is wrapped spirally around it throughout its length. The igniter is protected when packed by means of an "Igniter protector cap" which consists of a cotton bag containing a circular felt pad and fitted with a draw-string. This is secured by the drawstring over the igniter end of the base section and removed before loading. The cap is marked "Remove cap before inserting in gun" and has a lifting loop sewn across the base. Protector caps of paper may also be met with.

The length of the base section is 25.25 inches.

(c) The increment section consists of approximately 10-lb. 4-oz. of N.H. Powder in a cylindrical bag of similar material to that used for the base section. There is no igniter and, like the base section, the bag is wrapped spirally with a strip of silk cloth. The increment section is secured in position by the 4 ties sewn to the front end of the base section. These are led along the wall of the bag and tied across the front end.

The length of the increment section is 11.75 inches.

(d) Markings at the front end of each section include "Base" or "Increment", as applicable, the propellant lot number and the calibre and mark of the gun. The weight, grade and "BLK PDR", also the calibre and Mark of the gun, are marked on the igniter.

4. Packing of Cartridges and Stowage Dimensions.

These details are not yet available.

5. Shell, H.E. M. 101.

(a) The shell is of forged steel, streamlined and fitted with a gilding metal driving band. To prevent the possibility of propellant gases penetrating to the bursting charge through flaws in the base of the shell a lead disc is secured to the base by means of a copper cover plate. A rim formed on the cover plate fits into a circular groove in the base of the shell where it is secured by a caulked lead strip. A bakelite fuze-well cup, to accommodate the booster, is fitted at the inner end of the 2-inch fuze hole and enters a cavity formed in the filling. (Fig.179 is also typical for this shell).

The following bursting charges are used :-

T.N.T. Grade 1 (15.56-lb.)
Anatol 50/50 with T.N.T. booster surround (14.78-lb.)
Anatol 80/20 with T.N.T. booster surround (14.05-lb.)
Trinonite (Picric acid and mononitronaphthalene) (16.16-lb.)

(b) The body of the shell is painted yellow and bears the following stencilling :-

- (i) A number of black squares with a punch mark in the centre of each. This is the weight zone marking and is based upon the weight of the filled shell with fuze-well cup. The zones corresponding to the marks are as follows :-

1 square.	Over 89-lb. up to 90.1 lb. inclusive.
2 squares.	" 90.1-lb. " " 91.2 lb. "
3 squares.	" 91.2-lb. " " 92.3-lb. "
4 squares.	" 92.3-lb. " " 93.4-lb. "
5 squares.	" 93.4-lb. " " 94.5-lb. "
6 squares.	" 94.5-lb. " " 95.6-lb. "

Markings of 5 squares or less are arranged in one row. With markings of 6 squares the sixth square is marked below the centre of the row.

- (ii) 155G, indicating the 155 mm. gun.

- (iii) TNT, when filled cast T.N.T.
AM.50-50, when filled cast Amatol 50/50.
AM.80-20, when filled Amatol 80/20.
TRIMONITE, when filled cast Trimonite.

(c) The fuze-hole plug, "Plug, lifting, type G" is made in the form of an eyebolt from cadmium plated or parkerized steel. The plug protrudes 2.9 inches from the fuze hole and weighs 1.75-lb. The internal and external diameters of the eye are 1.25 and 2.25 inches respectively.

(d) The grummet is 17.75 inches long with an eye-splice at each end and is made from 3 strand Manila rope of .625 inch diameter. A 3/4-inch tie of tarred jute is used for the tying together of the eye-splices.

6. Stowage dimensions of Shell H.E. M.101.

The shell is issued unboxed, plugged (without booster) and fitted with a grummet. The stowage dimensions are: length with plug 26.8 inches, diameter with grummet 7.4 inches, weight 94.3-lb.

469. PRIMER, PERCUSSION, 21 GRAIN MARK IIA1. DESCRIPTION AND PACKING.

Fig. 173.

This is an American vent percussion tube with a mouth of .348 inch diameter for use in B.L. guns. The chamfered flange at the head is .515 inches in diameter and the body tapers from .356 to .348 inches. The length is 1.595 inches and the filled weight 183 grains.

The cap chamber, formed in head of the brass body, communicates with the magazine through a single flash hole. The magazine contains 21 grains of "Army Black Powder, Grade A-4" and is closed at the mouth by beeswax. A disc of onion skin paper is inserted between the powder and the beeswax and the mouth is sealed with orange shellac varnish. The percussion cap, includes an anvil and is made to the same specification as the cap for the .30 small arm cartridge. The cap is secured by burring over the mouth of the cap chamber.

The following details are stamped in the head :-

Filler's initials and lot number.
Year of filling and the mark of the primer.

Packing and Stowage Dimensions.

50 primers are packed in aterne plate box with newsboard separators. The box is closed by a soldered tear-off strip and bears a lid label giving the quantity, the filler, date of packing and lot number. The dimensions of the box are 5.75 x 3 x 2 inches and the filled weight is 1.72 lb.

48 boxes (2,400 primers) are packed in a wooden box with a lid secured by screws. The dimensions of the box are 25.4 x 10.8 x 9.8 inches. The filled weight is 96.5 lb. and the empty, 14 lb.

470. BOOSTER M.21. DESCRIPTION AND PACKING. (Fig.175).

The M.21 Booster, used with the point detonating fuze M.51, differs from Booster M.20 (described in Item 392, Bulletin No.24) in that the centrifugal pin is not engaged by a locking pin and in the addition of a "Cotter pin" for safety in transport. The pin is of the split type with a split ring attached at the head and is inserted from the exterior of the body. The inner end protrudes into the rotor recess and engages a step formed in the rotor thus providing a positive lock. The inner ends of the pin are splayed so that a pull of 5 to 35 lb. is necessary for removal. The pin is removed before inserting the booster in the fuze-hole of the shell.

Packing and Stowage Dimensions.

The boosters are normally issued in cartons and boxes as described in Item 392, Bulletin No.24.

471. FUZE, POINT, DETONATING, M.51.
Fig.176.

This American fuze, used in conjunction with Booster M.21 (See Item 470), is designed to ensure that the centrifugal safety devices will function correctly at lower rates of spin. To this end the fuze differs from the fuze M.48 (described in Item 393, Bulletin No.24) in being fitted with a device to prevent the centrifugal pins returning to the unarmed position when rotational velocity decreases.

The device consists of a brass pellet, referred to as a "Lock", pivotted on a steel axis pin in a slot formed in the plunger body. The slot is positioned at right angles to the two channels housing the centrifugal pins. The lock pellet is recessed at the forward end and solid at the base end. The recessed portion passes over the plunger when the lock rotates on its pivot and the solid end results in a bias which causes this end to move outwards under the influence of centrifugal force and so brings the recessed end between the displaced centrifugal pins. The rotation of the lock is limited by a tongue formed on a gilding metal washer in the recessed end of the plunger body.

Packing and Stowage Dimensions.

The packages and stowage dimensions are the same as those for the M.48 fuze. These are given in Item 393, Bulletin No.24, (see amendment in this Bulletin).

472. SHELL, B.L., H.E. M.107 AND CHARGES PROPELLING, M.3 AND M.4 FOR 155 MM. HOWITZER M.1.

1a The complete round for this American B.L. howitzer consists of the following components:-

Tube, percussion	-	Primer, percussion 21 grain Mk.IIA1
Cartridge, B.L.	-	Charge, propelling, M.3 (Green bag).
		Charge, propelling, M.4 (White bag).
Booster	-	M.21.
Fuze	-	Point, detonating, M.51.
Plug, fuze-hole	-	Plug, lifting, type "G".

2. Primer, Booster and Fuze.

Details of these components and references to their packages are given in Items 469, 470 and 471, respectively.

3. Charge Propelling M.3 (Green bag). (Fig.177)

The charge consists of approximately 5-lb. 9-oz. of N.H. or F.N.H. Powder. The arrangement consists of 4 short cylindrical bags, assembled end to end, and secured by 4 ties. The ties are sewn to the base section at equidistant points and are tied across the end of the front section; they are each marked "Charge M.3". Fairleads for the ties are not provided. The bags are made of green cartridge cloth and each is marked at the forward end with a large figure indicating the charge. The following details are marked on the base of sections 2, 3, 4 and 5, "Chge.M.3, Increment, Zone (charge number), Powder Lot, 155 MM.H." Similar details, with the substitution of "Base" for "Increment", are included on the forward end of the base portion.

An igniter, made from closely woven red silk and containing approximately 3-oz. of "Army Black Powder, Grade A-1" in a central circular pocket, is attached at the rear end of the base portion. The igniter is protected when packed by means of an "Igniter protector cap" as described for the 155 mm. gun cartridge.

The approximate weights of the sections are as follows :-

Section 1	-	1-lb. 14.5-oz.
Section 2	-	8- oz.
Section 3	-	10.5-oz.
Section 4	-	15- oz.
Section 5	-	1-lb. 9- oz.
Total	-	5-lb. 9-oz.

The M.3 propelling charge has an overall length of 16 inches and a diameter of 5-inches.

Details of packing are not available.

4. Charge Propelling M.4 (White bag).
Fig. 178.

The charge consists of approximately 13-lb. 7.5-oz. of N.H. or F.N.H. powder and is also of the "Base and Increment" type. The arrangement of the charge is generally similar to the M.3 but there are only three bags which are of white cartridge cloth. The bags comprise charges 5, 6 and 7 and are numbered accordingly. The approximate weights of the sections are as follows :-

Section 5	-	6-lb. 15-oz.
Section 6	-	3-lb. 2-oz.
Section 7	-	3-lb. 6.5-oz.
Total	-	13-lb. 7.5-oz.

The M.4 propelling charge has an overall length of 21 inches and a diameter of 5.8 inches.

Details of packing are not available.

5. Shell, H.E., M.107.
Fig. 179.

This shell differs from the M.101, described in Item 468, in having a narrow driving band. The methods and natures of filling are similar and the filled weight is approximately 95-lb.

The marking differs from that described for the M.101 shell in the substitution of "155 H" (calibre, howitzer) and "Shell M.107" (mark of shell). The zone system of weight marking is the same.

473. PLASTIC EXPLOSIVE. INSTRUCTIONS FOR INSPECTION.

Reference Item 418, Bulletin No.25.

The instructions given in para.2 of Item 418 are cancelled and the following substituted :-

"2. Any charge when removed from its wrapping should be free from hard and brittle skin. A preliminary cross-sectioning of the charge by means of a knife, magazine, will indicate whether any serious incrustation has occurred. A STEEL KNIFE MUST NOT BE USED. The charge should not be re-made after this test, but destroyed in the appropriate manner.

The cartridge under test should be capable of being moulded, broken and re-united by hand without crumbling. It should be noted that when a charge is first handled it may feel stiff, but that this stiffness should soon disappear under handling, the charge more or less rapidly working up into a plastic mass resembling luting Mk.IV. It is not possible to suggest comparison for plasticity with a material like putty or plasticene as these substances are too variable in consistency. If any doubt exists no decision should be made until the sample under test has been worked by hand to a temperature not lower than 68°F. Finally before a lot is sentenced "unservicable" it is essential to ascertain that the deterioration is general over the whole lot, and that the lot is not sentenced on one single cartridge where the deterioration may be due to a faulty wrapper".

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474. TRANSPORT OF AMMUNITION. USE OF NET SLINGS FORBIDDEN.

Accidents involving explosion with resultant injuries and loss of life have occurred at seaports through the use of nets in slinging ammunition.

The use of net slings for this purpose is forbidden by Para.32 of the pamphlet "Conveyance of Government Explosives in Freight Ships During the Present Emergency". Ammunition trays, especially designed for the purpose, or alternatively, rectangular scale boards must be used in order to avoid serious accidents and damage to stores.

475. PROPELLANT CODE LETTERS. USE OF LETTER "N" FOR N.C. POWDERS OTHER THAN N.C.T. OF 1914-18 MANUFACTURE.

Reference Item 316, Bulletin No.21 and Item 329 Bulletin No.22.

Cartridges filled N.C. powder and made up prior to the introduction of code letters for N.H. and F.N.H. powders were stencilled with the code letter N irrespective of the type of powder. In these circumstances, those containing N.C.T. of 1914-18 manufacture can be identified by the letters D N. as a prefix to the lot number of the propellant.

476. MARKING OF PROJECTILES. AMERICAN SYSTEM.

The following is a summary of the colours, bands, stencilling and symbols used for the identification of American projectiles. It should be noted that in contrast to the British practice the colour grey is used for chemical, smoke and incendiary natures and that each of these natures is distinguished by bands of different colours and is stencilled "GAS", "SMOKE" or "INCENDIARY".

Tips and ring markings are not used.

(1) Body Painting and Significance.

Yellow	High explosive filling.
Red	Gunpowder filling, (including shrapnel shell)
Blue	Practice projectile with greatly reduced powder filling.
Black	Practice projectile (inert).
Grey	Chemical, smoke or incendiary fillings.

(2) Distinguishing Bands.

These are painted near the shoulder of projectiles.

Red band.	Semi steel shell.
Two blue bands.	Shot sentenced to practice. (37 mm. A.P. shot).
Yellow band.	Smoke shell (charged white phosphorus unless indicated otherwise by stencilling).
Two yellow bands.	Smoke shell charged titanium tetrachloride. This is an obsolescent marking. All smoke projectiles are now marked with one yellow band and stencilled to indicate the nature of the charging.
Purple band.	Incendiary filling.
Green band.	Chemical filling of a non persistent type.
Two green bands.	Chemical filling of a persistent type.

(3) Descriptive Stencilling.

(a) Colours.

The stencilling is in black on yellow or red projectiles and in white on blue or black projectiles. On grey projectiles the stencilling is in the same colour as the distinguishing band.

(b) Standard weight.

The standard weight of the unfuzed projectile is, in some instances, stencilled near the nose of the shell. The figures indicate pounds unless followed by a K for kilograms.

(c) Equipment.

The calibre of the piece is stencilled above the shoulder of the projectile and, where a gun and howitzer of the same calibre exist, the letters G or H are added. The letters GH are added in the case of a projectile suitable for firing in gun or howitzer. Projectiles for anti-aircraft or coast artillery equipments have the letters AA or SCG (Sea coast gun) added to the stencilled calibre.

(d) Nature of filling or type of shot.

The nature of the bursting charge in shell filled H.E. is indicated as follows :-

AM (or AMA) followed by a fraction, indicates Amatol.
EXP.D, indicates Explosive D (Ammonium Picrate).
TRIMONITE, indicates a mixture of Picric Acid and mono-nitro-napthalene.
T.N.T. is indicated by the letters as in the British system but without band.
TRIDITE, indicates a mixture of Picric Acid and dinitrophenol.

The nature of the charging, or filling, in chemical and smoke shell is indicated as follows :-

- CN GAS, indicates a chemical charging of the tear gas type.
- HS GAS, indicates a chemical charging of the blister gas type.
- SMOKE (without preceding letters) indicates smoke shell charged white phosphorus. This is an obsolescent marking and was used in conjunction with a single yellow band.
- W.P.SMOKE, indicates smoke shell filled white phosphorus. This is the current marking.
- F.M.SMOKE, indicates smoke shell charged titanium tetrachloride. This is the current marking. Prior to its introduction this charging was identified by the stencilling 'SMOKE' in conjunction with two yellow bands.
- F.S.SMOKE, indicates smoke shell charged chloro-sulphonic acid.

The type of shot is indicated by self explanatory stencilling as follows :-

- SHOT A.P., indicating armour piercing shot.
- SHOT Sem-A.P., indicating semi-armour piercing shot.
- T.P.SHOT, indicating practice shot.

When the design includes a tracer "WITH TRACER" is added.

(e) Serial Number of filled lot.

This number is normally stencilled below the letters indicating the nature of the filling. The number is preceded in most instances by the word "LOT".

(f) Mark of projectile.

This is stencilled on the lower portion of the wall of the projectile in the form MK.II or M.100 or, in the case of shot, follows the stencilling indicating the type. Semi steel shell have the letters SS added to the mark.

(4) Symbols.

Squares arranged around the nose of the projectile indicate the unfuzed weight. Each of the squares have a central punch mark. The number of squares used is based on weight zones which, as with the British "Unit System" vary with the calibre. A "lot" is all of the same weight zone.

Crosses arranged around the projectile immediately above the driving band are used on 75 mm. shell for the same purpose.

Squares around pointed shell, below the driving band, indicate the shell is not fuzed.

477. MARKING OF FUZES. AMERICAN SYSTEM.

The following colours are used for the identification of P.D. fuzes Marks III and IV* :-

- Mark III - blue-gray band below the waterproof cover.
- Mark IV* - green band round chamfered portion of head.

The following colours are used for the identification of types of P.D. fuzes Marks IV, IV* and V :-

- Non delay - white head
 - Short delay - black head
 - Long delay - Marks IV and IV*, black head and red detonator socket.
 - Mark V, black head and violet detonator socket.
- (Detonator socket is the name given to the lower or magazine portion of the fuze).

78. SHELL B.L. 6-INCH. C.P.B.C. AND 9.2-INCH M.P.C. USE OF CRATES.
Fig. 180.

Shell of the above-mentioned natures when shipped from America will be packed in wooden crates as shown. When removed from the crates the grumets will be placed in position over the driving band.

79. MINE B, TYPE "C". GENERAL DESCRIPTION.
Fig. 181 & 182.

This is a Naval mine of the contact type issued to the Land Service.

The platform container, (or cylindrical body) is of mild steel and is closed at the base by spot welding to a square base plate. A rubber ring is held between the underside of the container and the base plate to form a water proof joint. A hole is formed in the top of the container at the centre to receive the striker guide. The guide is of brass and has two internal longitudinal grooves. A steel cylinder to house the primer and known as the primer guide tube is welded between the container and the base plate.

The base plate is 14 inches square and has, in addition to the primer hole, four filling holes which are closed by bungs. The filling consists of cast amatol with a half inch topping of T.N.T. The bung consists of a rubber ring held between two steel discs by a nut and bolt. Tightening of the nut draws the discs together and causes the rubber ring to expand in the filling hole. Holes are also provided near the corners of the base plate for the tie rods used for transport.

A steel hoop, known as the body ring, is welded around the upper portion of the container to carry the guide for the cover plate.

The striker is secured to the depressor cup and supported at the centre of a flat steel strip spring which is carried under tension in a bar welded to the upper side of the container.

The spring bar consists of a rectangular steel plate with up-turned edges and a central hole which fits over the striker guide in the top of the container. The upturned edges at the ends of the bar are slotted to receive the ends of the resistance spring supporting the striker and are drilled in two places to receive the two tension bars. The screw threaded ends of the tension bars pass through the drilled holes and through similar holes in a stiffening plate assembled outside each end of the resistance bar and are secured by loading nuts. The stiffening plates, secured by the nuts on the tension rods support the ends of the striker spring. The up-turned edge along one side of the spring bar is cut away in two places to provide clearance for the toe piece of the safety device in the safe position.

The safety device consists of steel rod inserted through a hole in the body ring, at right angles to the resistance bar, and carrying a toe piece at its inner end. The brass toe piece takes the form of a two armed fork with the inner ends of the arms enlarged so that when the rod is pushed inwards and the enlarged ends are beneath the spring supporting the striker, the spring, and therefore the striker, cannot move downwards towards the primer. The rod protrudes from the body ring and is holed or fitted with a cross pin near the outer end to facilitate manipulation by means of the arming tool provided. Two circumferential grooves formed near the centre of the rod engage the safety spring secured to the inside of the body ring. This spring engages in the outer groove when the rod is pushed in to locate the toe piece under the striker spring i.e. the safe position, and in the inner groove when the rod is pulled outwards to move the toe piece clear of the striker spring.

The guide for the cover plate consists of a steel ring with the upper edge turned inwards to overlap the flange formed on the cover plate. The guide is secured to the body ring by screws at equidistant points near its lower edge.

The steel cover plate is recessed and holed at the centre to receive the depressor which is secured by an inner and an outer nut; the inner nut being welded to the underside of the cover plate. The rounded lower end of the steel depressor fits into the depressor cup carried on the head of the striker and supports the cover plate.

A rubber cover is fitted over the mine from the top to keep out moisture. The cover is fitted with a canvas patch on the underside of the top portion to provide protection from the upper end of the depressor and has a hole near the lower edge for the rod of the safety device.

Primer.

The empty primer case is issued in the primer guide tube of the mine and is prepared for use when required.

The case consists of a brass tube prepared to receive a commercial No. 8 detonator and a 12 bore cartridge head at the top end and a $4\frac{3}{4}$ oz. cartridge of Nobels Polar Blasting Gelatine in its interior. The base of the case is closed by a bung device fitted to a stopper the stem of which carries a second bung device for the closing of the primer guide tube.

The arrangement at the top end of the case consists of a brass or steel disc, known as the detonator carrier, which is annelured to the tube and is recessed and perforated to receive the cartridge head and detonator. The recess is closed against the entry of moisture by means of a copper disc pressed down on a rubber washer by the screwed locking ring.

The closing arrangement at the base of the case consists of a rubber washer expanded radially in the tube between the head of the brass stopper and the outer bung plate by the tightening of the primer nut on the stem of the stopper.

The arrangement carried at the base of the primer case for the closing of the primer guide tube consists of a rubber washer held between the outer bung plate of the case and a brass plate supported by a second nut on the stem portion of the stopper. The tightening of this nut causes the rubber washer to expand radially in the primer guide tube.

The primer case is removed from the guide tube to prepare it for use. This is done by removing the lower nut, plate and rubber washer and pulling out the case.

The case is then opened at the base by removing the nut and pulling out the stopper with plate and rubber washer. The cartridge is inserted from the base and the closing arrangement of the case replaced. The locking ring, copper disc and rubber washer are then removed from the top end of the case and a detonator cavity is formed in the cartridge by inserting a rectifier through the hole in the detonator carrier. The detonator and cartridge head are then inserted and the rubber washer, copper disc and locking ring are replaced. The screwdriver for the mine is fitted with studs to engage the recesses in the locking ring.

Before replacing the primer in the guide tube of the mine it must be ensured that the rod of the safety device is pushed into the safe position so that the toe piece is under the spring of the striker. The rod is pulled out to the armed position when the mine has been placed in position. The arming tool provided for this purpose consists of a 22-inch flat steel bar with upturned edges and a slot at one end. The tool is used as a lever by passing the slotted portion over the protruding safety bar so that the lower end bears on the mine as a fulcrum and the arms formed by the slot bear against the cross pin of the safety bar. A split pin is provided for insertion in safety bars which are not fitted with cross pins. The arming tool is also designed to be used as a spanner for the bung nuts.

Marking.

The mine is painted service colour and has a one inch red band round the lower part of the container. The underside of the base plate is stencilled to indicate the filling factory, date of filling, fraction applicable to the amatol filling and the grade of T.N.T. This stencilling is in red. The letter "N", indicating the naval origin of the store, may also be found stencilled in white.

Weights, Dimensions and Packing.

The dimensions of the mine are, base plate 14 inches square, overall diameter 12.5 inches, overall height 9.5 inches. The weight of the filling is approximately 20 lb. and the total weight 50 lb.

The mines are issued unboxed, with empty primor cases, and assembled in pairs by means of tie bars. The two mines are positioned cover towards cover and connected to form a rectangular assembly by passing the four tie bars through the corner holes in the base plates. The tie bars are provided with welded supports which bear against the inner surfaces of the base plates, thus preventing the weight of one mine being taken by the other, and the rods are secured by nuts at the outer ends. These nuts are fixed in steel covers which keep them and the base plate clear of the ground.

The stowage dimensions of the assembly are 14 x 14 x 20 inches. The weight is approximately 120 lb.

Action.

Pressure applied to the cover plate is transmitted by the depressor and its cup to the spring supporting the striker. With the safety rod pulled out so that the toe piece is clear of the spring, the pressure causes the spring to bend in the reverse direction with considerable force and the striker, under this motive power, moves through its guide striking the cap in the cartridge head and so initiates the detonation of the filling through the detonator and gelatine cartridge.

For details of the firing load see Item 480.

480. MINE "B", TYPE "C". CHANGING OF RESISTANCE SPRING.
Figs. 181 and 182.

New resistance springs are fitted and the tension adjusted for a firing load of 120 ± 5 lb. by the following procedure with mines in which the depressor cup, securing the striker to the spring, is screwed to the head of the striker.

(a) To remove the spring for replacement.

1. Ensure that the safety rod is pushed right home to the safe position.
2. Remove the primer.
3. Remove the rubber cover.
4. Pull out the safety rod to the armed position.
5. Remove the screws securing the cover plate guide and remove the guide and the cover plate.
6. Unscrew the depressor cup and remove the striker from spring.

7. Slacken off the loading nuts by means of the spanner provided (Fig. 183) and remove the spring with the aid of the tool also shown in Fig. 183. For this purpose the base of the spindle on the tool is inserted in the striker hole of the spring and secured beneath the spring by fitting the circlip to the base. By closing the handles the spring is drawn up in the form of an arc by the rising spindle, thus shortening the distance between its ends, and can be readily removed from the spring bar.

8. Clean the striker and the interior of the striker guide, care being taken to remove all traces of shellac varnish.

(b) To insert and adjust a new spring.

1. Pull out the safety rod to the armed position.
2. With the loading nuts still slackened and the new spring drawn up into an arc in the tool (Fig. 183), insert the spring in the spring bar by directing the ends into the slots as the handles of the tool are slowly opened.
3. Remove the safety rod, where possible, and substitute the testing rod (Fig. 184) which will be pushed fully home to the safe position i.e. toe-piece under the spring. Insert the striker through its guide, from the underside, by means of the inserting tool (Fig. 184) and secure it to the spring by the depressor cup.

If the safety rod cannot be removed and the testing rod substituted, the testing striker will be fitted to the spring instead of the service striker and the stop pin inserted in the lower hole of the testing striker.

4. Place the spring under tension by tightening the loading nuts, care being taken to ensure that both tension rods take the load.
5. Test, and adjust if necessary, the tension on the spring to obtain the tension for a firing load of 120 ± 5 lb. The test is made by placing the mine on the stand beneath the weight arm of the load testing machine (Fig. 185) and allowing the weight to be gently applied to the spring by careful raising of the handle. The weight required to depress the spring to the toe-piece of the testing rod, or the stop pin in the testing striker, should not be less than 115 lb. or more than 125 lb. Adjustment is made by means of the loading nuts until this tension is obtained.
6. Remove the testing rod and replace the safety rod or, if the testing striker has been used, replace this by the service striker.
7. Push the safety rod into the safe position.
8. Lightly coat the resistance spring and striker and particularly the junction of the spring and bar with mineral jelly.
9. Replace the cover, cover guide, primer and rubber cover.
10. Stencil "SPIT" in one inch white lettering on the underside of the base plate to indicate that the new spring has been fitted.

481. MARKING OF SHELL TO INDICATE RUSTED CAVITY WALLS.

Q.F., H.E., shell for the 3.7-inch gun with cavity walls corroded under the varnish have been filled and specially marked in black paint with the date of filling enclosed in a rectangle. Shell bearing this marking are to be fired within one year of the date of filling.

482. MARKING OF PACKAGES CONTAINING CARTRIDGES Q.F. 3.7-INCH GUN, FILLED CORDITE N/S.

Certain lots of Cordite N/S.164-048 are being used for the propellant charge in Q.F. 3.7 inch gun cartridges for home use only. To enable these cartridges to be identified, and restricted to home use, the packages are stencilled with the letters "A.D.G.B." on the lid. The individual cartridges bear no special markings to indicate this restriction.

483. WEIGHT MARKING. B.L. 6-INCH 100-LB. STREAMLINED SHELL.

Reference R.A.O.S. Part II, Pamphlet No.1, Paras.103 to 105 and Plate XXVII, the following table gives the details of the unit system of weight marking for the 6-inch 100-lb. S/L. shell with fuze No.117 as the standard. The weight of this fuze is 2-lb. 8-oz.

Unit	lb.	oz.
+ 3	103	8
	102	8
+ 2	102	8
	101	8
+ 1	101	8
	100	8
0	100	8
	99	8
- 1	99	8
	98	8
- 2	98	8
	97	8
- 3	97	8
	96	8

484. Q.F. 40 MM. AMMUNITION MANUFACTURED IN U.S.A. MARKINGS.

Reference Item 396, Bulletin No.24.

The painting and markings quoted in Item 396 are for ammunition manufactured to U.S. Naval Ordnance designs for issue to the British Naval Service. These designs appear to differ considerably from U.S. Army designs and the ammunition is not intended for Land Service.

The following markings are used on Q.F. 40 mm. ammunition manufactured in U.S.A. for Land Service :-

Cartridge Case, empty.

This will be stamped 40 mm., M.22 and also with the lot number, maker's initials and year of manufacture.

Shell Empty.

The shell will be marked Mk.II and will carry manufacturers initials, lot number and year of manufacture.

Fuze.

The fuze retains its designation of fuze No.251.

Complete round.

The H.E. shell will be painted yellow and will have 40 MM. MK.I stencilled in black on the side of it.

The base of the cartridge case will be stencilled with the ammunition lot number, year of filling, initials of filler, calibre and designation of the shell.

485. FUZE D.A. & PERCUSSION NO.119. LOTS RESTRICTED IN USE.

Fuze lots which fail to come up to the standard conditions for comparatively low velocity equipments at "Acceptance" proof but are suitable for use in certain equipments which normally fire at high velocity are now being accepted for restricted use.

No special marking has been introduced for these fuzes, but, in order to ensure that they are used only in the appropriate equipments, their issue will be limited to shell which are issued for such equipments already fuzed.

Fuzes issued packed in cylinders are not restricted in use.

In these circumstances, No.119 fuzes recovered from shell which are issued fuzed will not be used for shell of another equipment without reference to C.I.A.

486. PACKAGES. AMMUNITION. USE OF DARK BROWN PAINT.

In order to overcome difficulties in the supply of Service colour paint for ammunition packages, the use of dark brown, as a substitute, has been approved.

487. CARTRIDGES B.L. 6-INCH 26-CWT. HOWITZER; 6-LB. 14 $\frac{1}{2}$ -OZ. N.H.033 SUPER CHARGE. PACKAGES.

Box cartridge C.239 has been approved as a temporary package to hold 6 of the above mentioned cartridges each in a container No.55 and with a 3-inch end packing piece.

Container No.55 is a rolled paper cylinder with tinmed plate end pieces. The dimensions are, length 10.25 inches, diameter 6.5 inches and the weight, empty, is approximately 1.75 lb.

The stowage dimensions of the steel box C.239 are 25.4 x 17.6 x 10.3 inches. The weight of the empty box is 20 lb. and the weight when filled is approximately 75 lb.

Box cartridge C.224 may also be used for these cartridges. This steel box holds 8 cartridges wrapped individually in non absorbent paper. The box is sealed as effectively as possible with luting and tape.

The stowage dimensions of box C.224 are 24.7 x 15.25 x 10.2 inches. The weight of the empty box is 18.5 lb. and the weight when filled is approximately 79 lb.

488. SALVAGE. CHARGES 2.5-INCH PROJECTOR.

Rubber pads from charges for the 2.5-inch projector will be recovered after practice and disposed of as ammunition salvage and not as rubber salvage.

489. BOMBS, M.L., 2-INCH MORTAR, H.E. PACKING OF BATCHES.

The system of packing these bombs, 6 in a carrier and 3 carriers in a box, (See item 26, Bulletin No.4) with the normal batch of 2,000 rounds results in a residual of 2 rounds. These are set aside from successive batches until the 18 required to complete a package are available. Boxes containing these rounds of various batches are stencilled to show the batch numbers involved. Batch labels and markings appropriate to the contents are provided on the containers forming the carrier.

490. AMENDMENTS.

Bulletin No.24.

Item 393, page 8, para. headed "Packing" :-

Line 7, delete "15.9 x 15.9 x 13, i.e. 2 cubic feet" and
substitute "17.4 x 15.9 x 13, i.e. approx. 2 cubic feet".

Fig.142, lettering at base of fuze, delete "Button" and substitute
"Bottom"

Item 396. After line 1 insert "See Item 484 Bulletin No.27"

Bulletin No.25.

Item 418. Delete the whole of para.2 and substitute "See Item 473,
Bulletin No.27"

Bulletin No.26.

Page 8, line 1, delete "452" and substitute "453".

Item 451, line 13. Delete "32" and substitute "34"

Item 452. After last line add, "The rubber cover must be used with
fuze No.700".

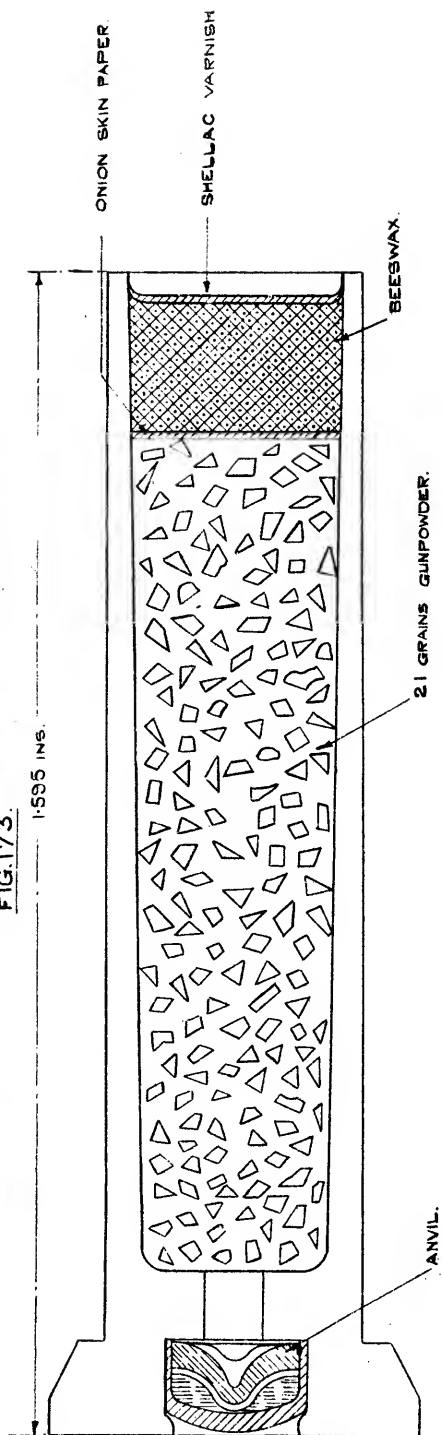
Item 460, sub para. headed "Propellant Charge", line 10.
Delete "is a nitroglycerine propellant and contains" and
substitute "consists of"

Line 12. After "cylinders" insert "of N.C. powder"

Item 464, line 3, After "propellant" insert "is an N.C. powder and"

Line 10. After "-nitroglycerine", delete "." and add
"and akardite."

PRIMER, PERCUSSION, 21 GRAIN, MARK II A.I.
FIG. 173.



CHARGE PROPELLING 155 M.M. GUN M.I. 32.25 LB N.H. OR F.N.H.
FIG. 174.

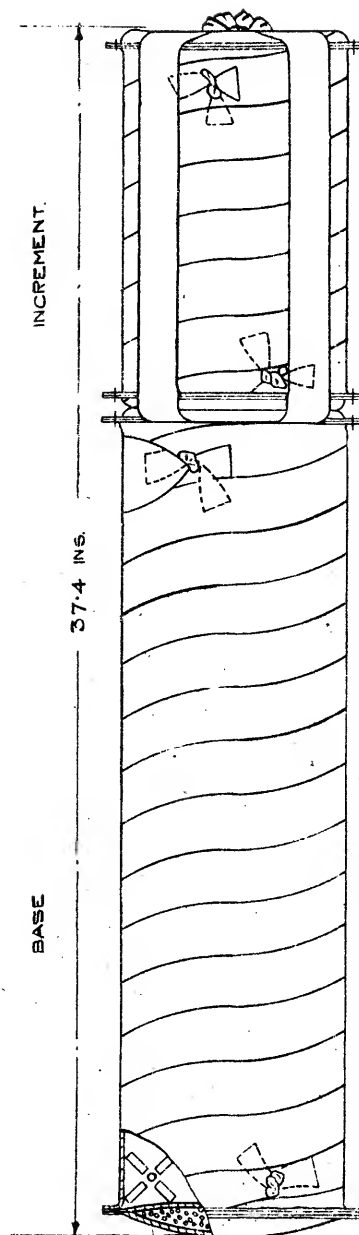


FIG. 175.
BOOSTER M. 21.
Scale 7/8.

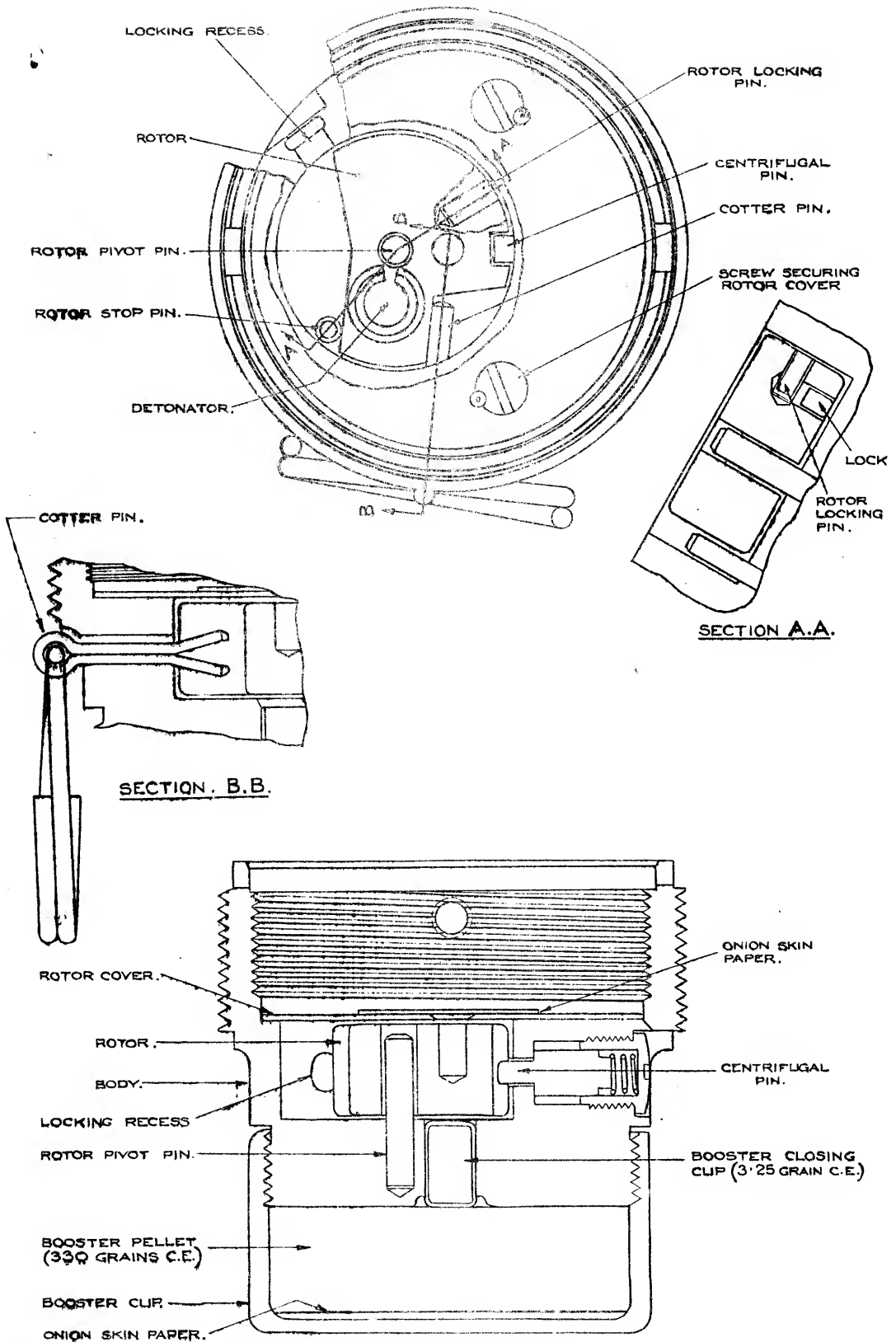
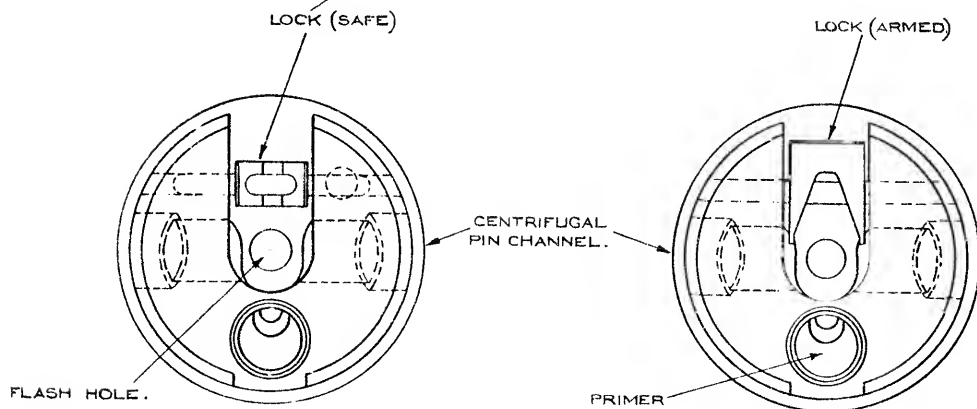
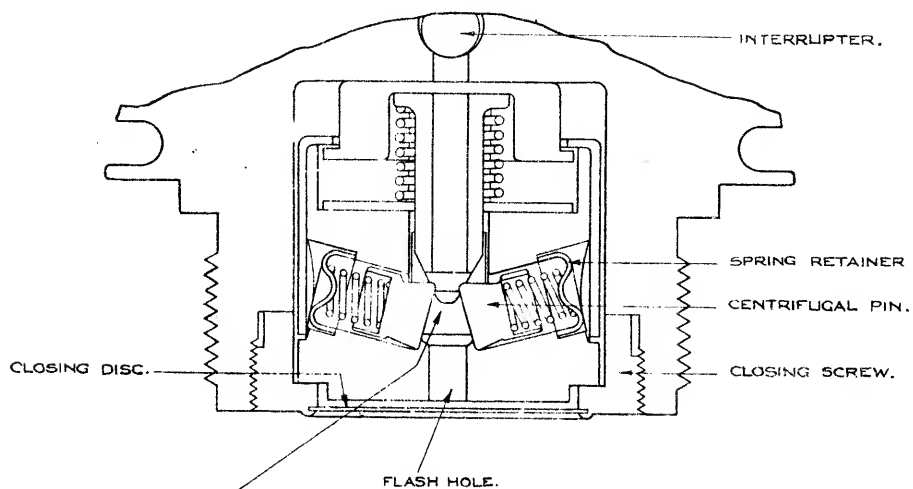
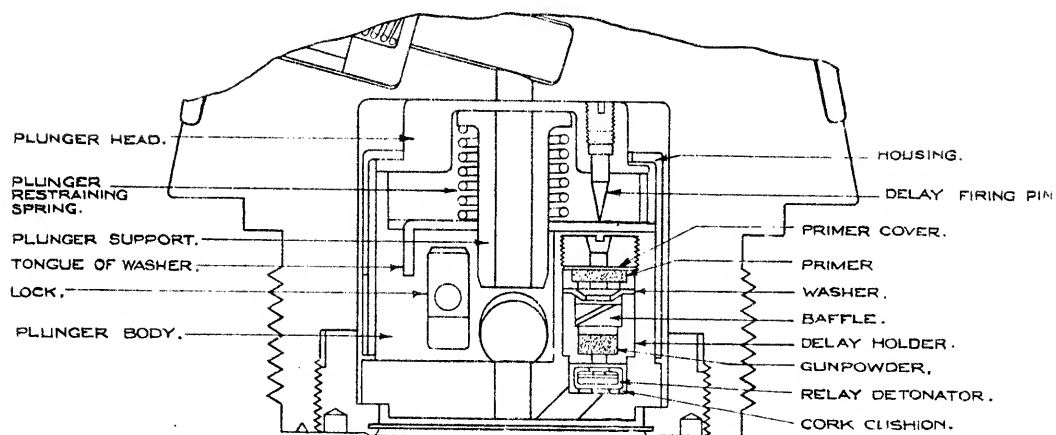


FIG. 176
FUZE, POINT DETONATING M51.



CHARGES, PROPELLING, FOR 155 M.M. HOWITZER M.I.

FIG. 177

M.3. (GREEN BAG.)

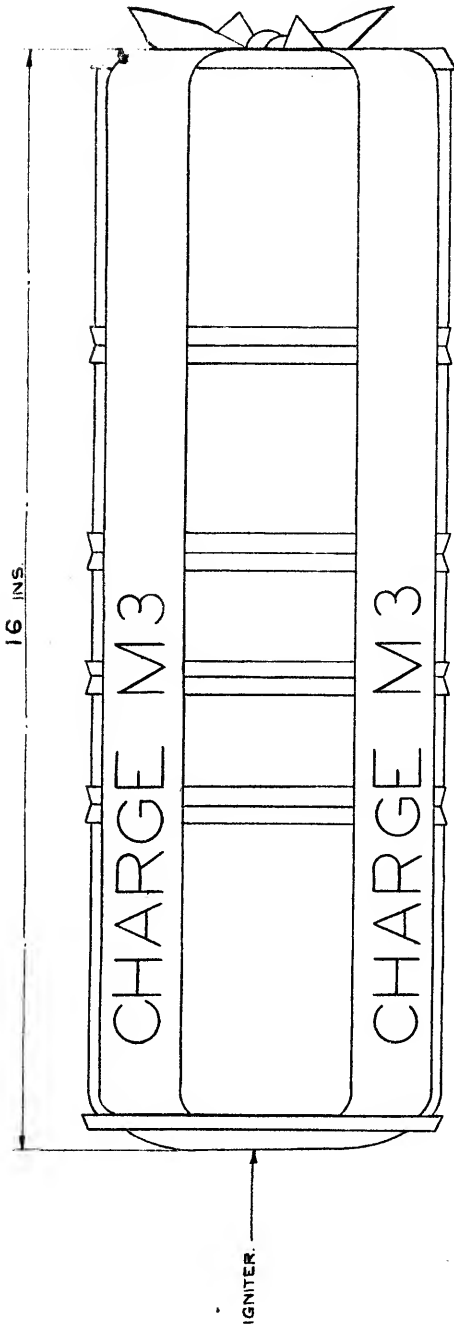


FIG. 178

M.4 (WHITE BAG.)

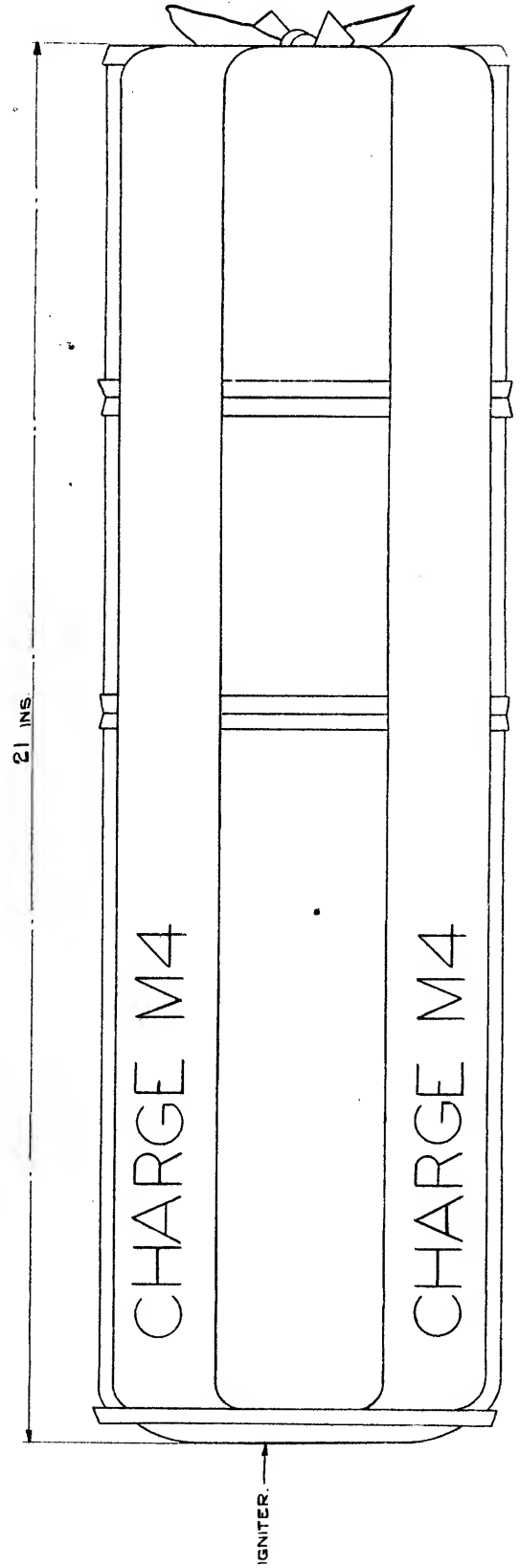


FIG. 179.
SHELL, B.L., H.E., 155 MM.HOWITZER, M107.

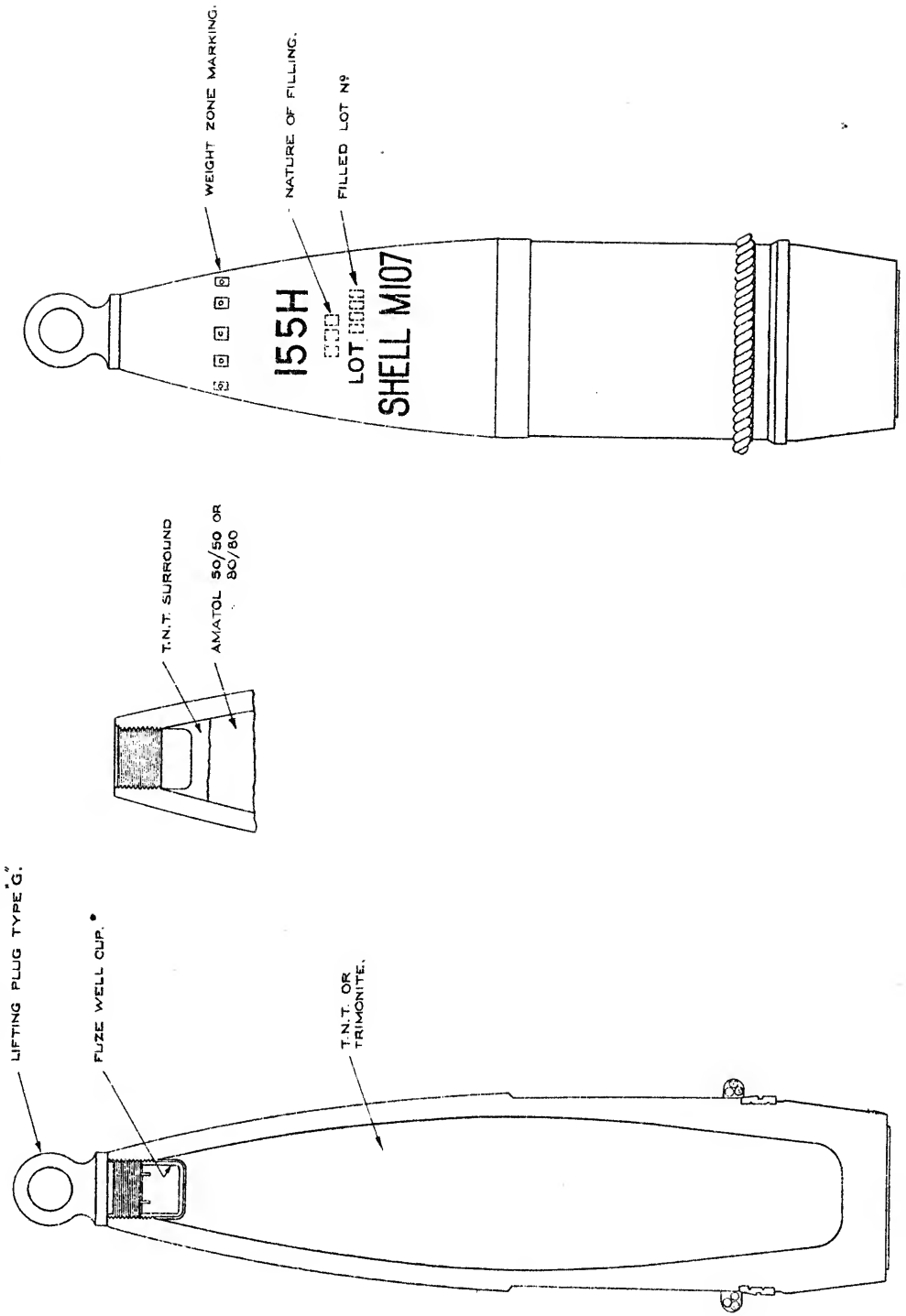
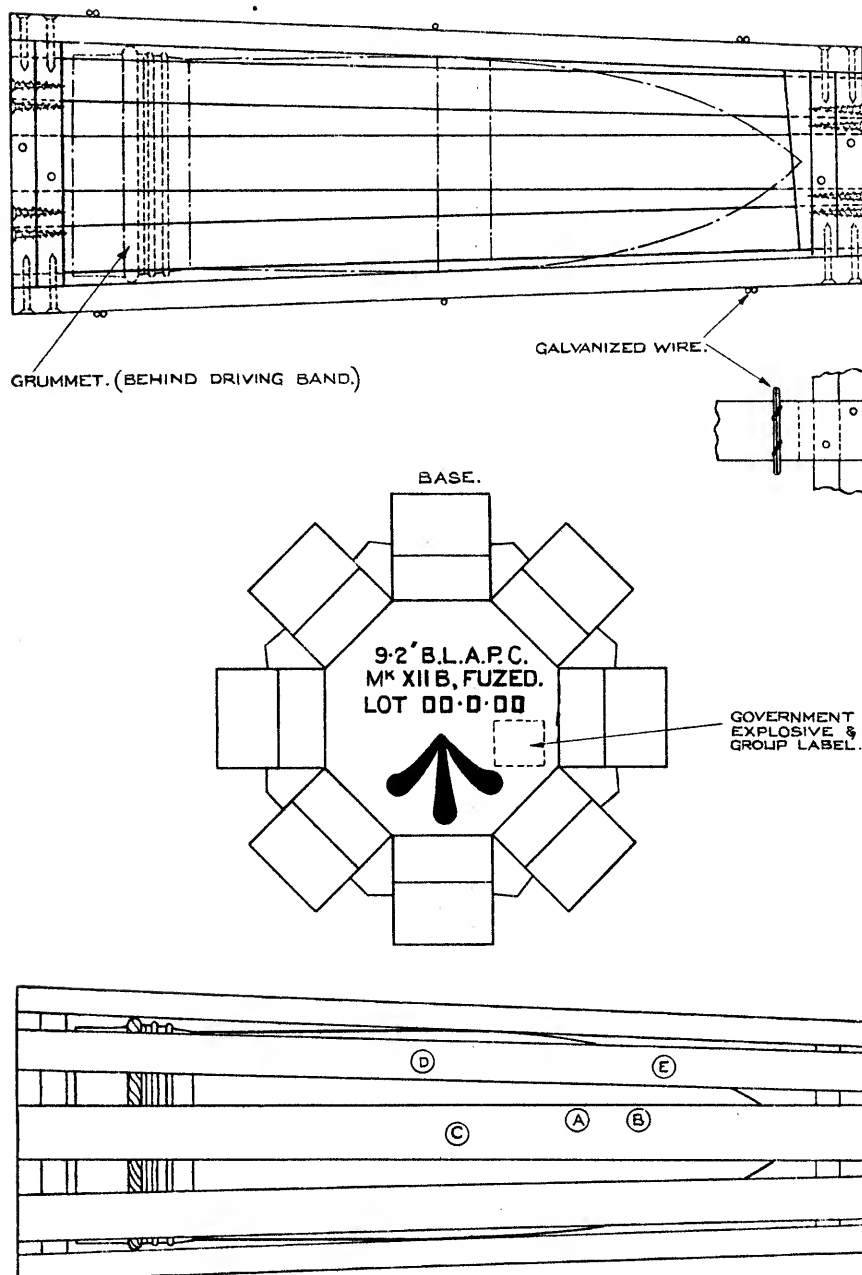


FIG. 180.
PACKING CRATE FOR POINTED SHELL.
 (B.L. 6-INCH & 9-2-INCH GUNS.)



- (A) CALIBRE & MARK OF SHELL.
- (B) "FUZED" OR "WITHOUT FUZE".
- (C) SERIAL NUMBER OF FILLED LOT.
- (D) "EXPLOSIVE PROJECTILE" (FILLED SHELL).
- (E) NATURE OF FILLING.

FIG 181.

MINE "B," TYPE "C"

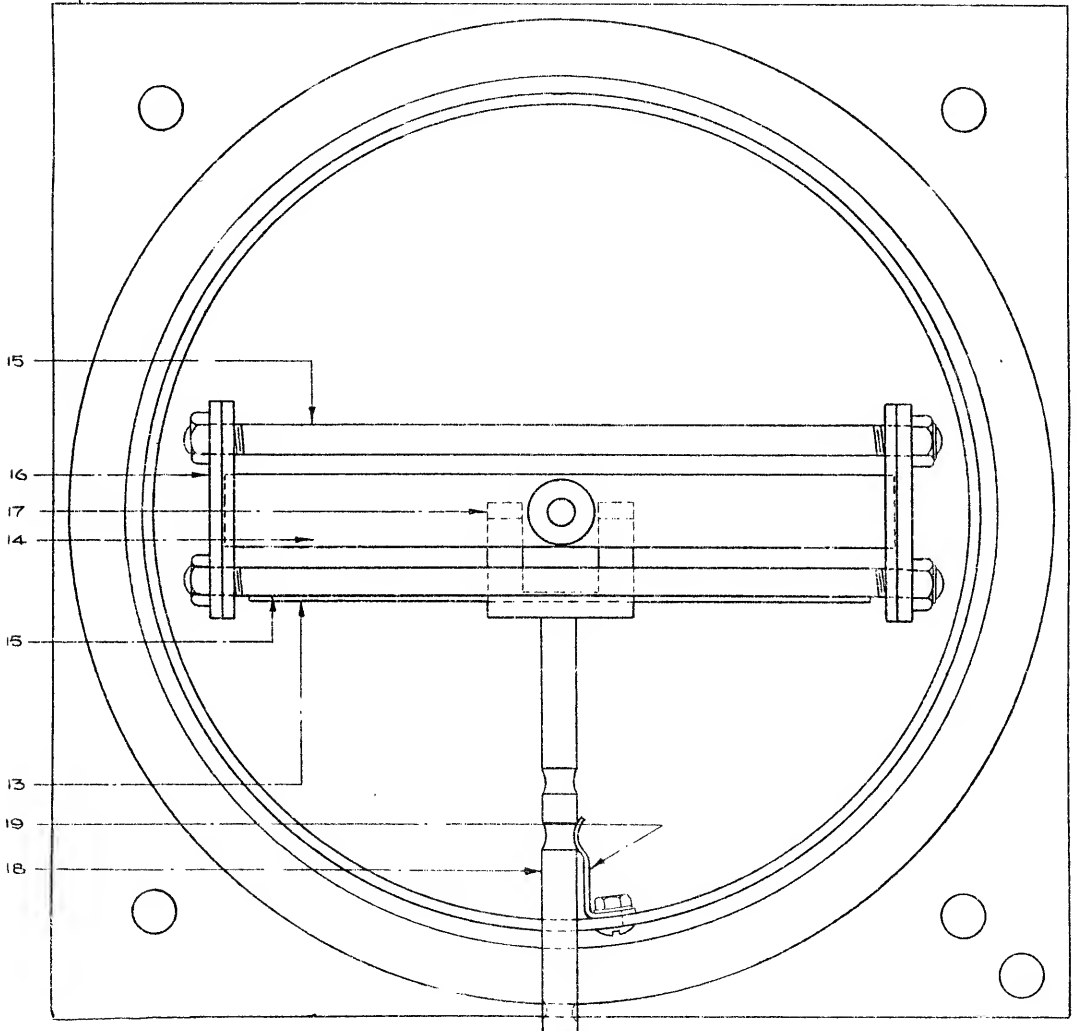
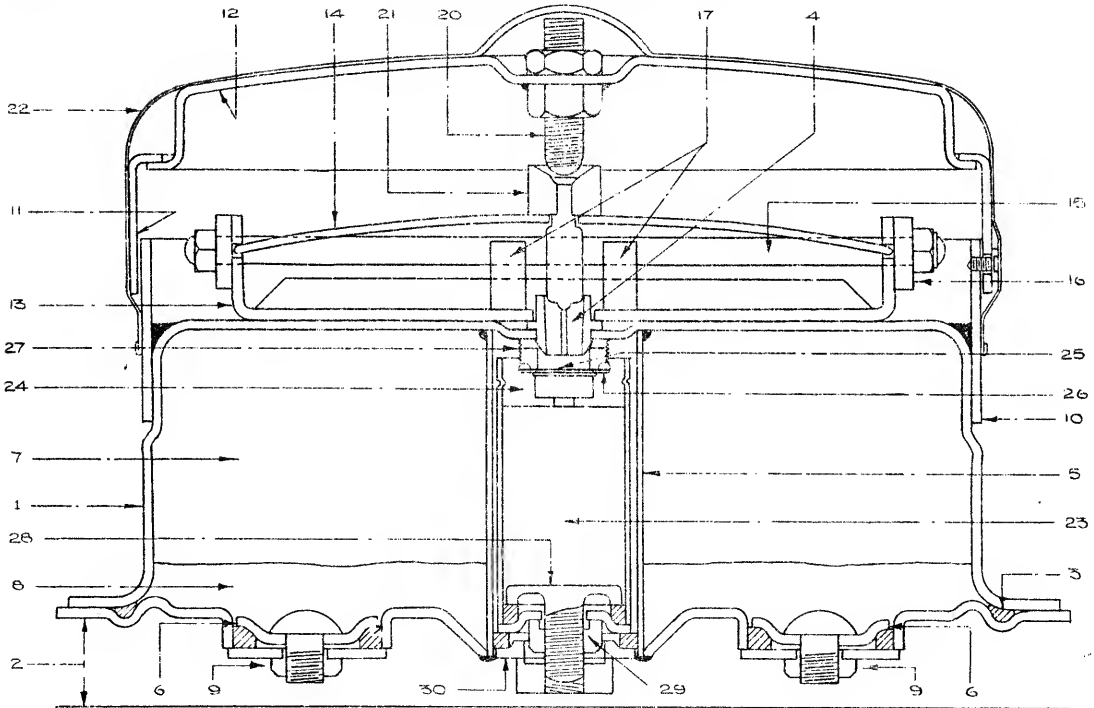
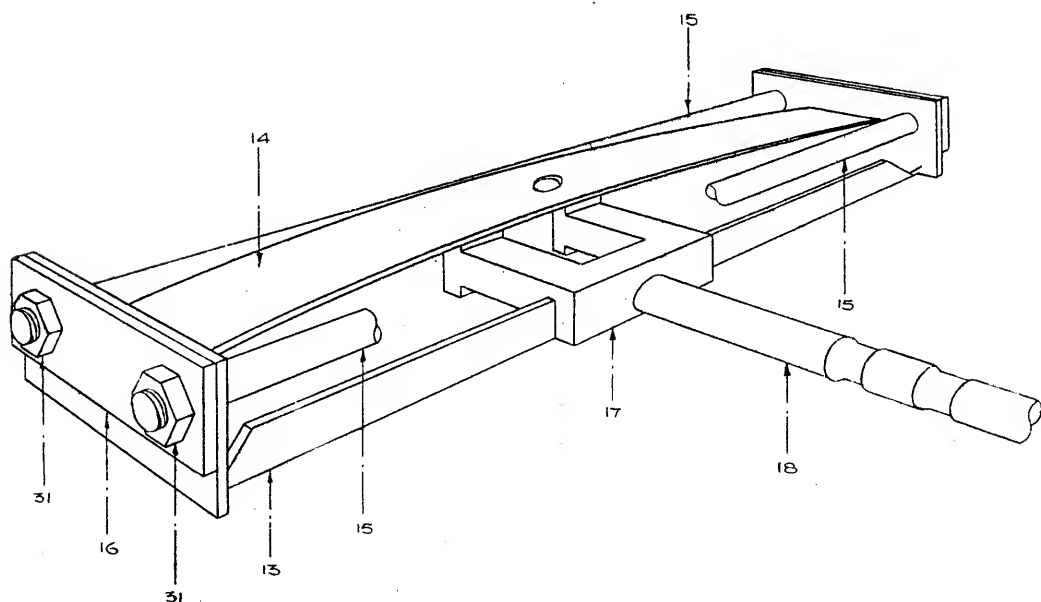
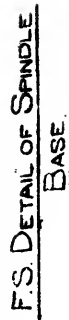
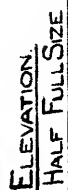
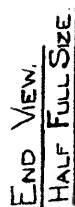
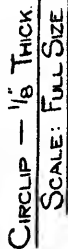
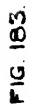


FIG. 102
MINE "B" TYPE "C" SPRING BAR ASSEMBLY



ITEM N°	DESCRIPTION	ITEM N°	DESCRIPTION
1	PLATFORM CONTAINER	17	TOE PIECE
2	BASE PLATE.	18	SAFETY ROD.
3	RUBBER RING	19	SAFETY SPRING.
4	STRIKER GUIDE.	20	DEPRESSER.
5	PRIMER GUIDE TUBE.	21	DEPRESSER CUP.
6	FILLING HOLES.	22	RUBBER COVER.
7	AMATOL FILLING.	23	PRIMER CASE.
8	T.N.T. TOPPING.	24	DETONATOR CARRIER.
9	FILLING HOLE BUNGS.	25	COPPER DISC.
10	BODY RING.	26	RUBBER WASHER.
11	COVER PLATE GUIDE.	27	LOCKING RING.
12	COVER PLATE.	28	STOPPER.
13	SPRING BAR.	29	PRIMER NUT.
14	RESISTANCE SPRING	30	OUTER BUNG PLATE.
15	TENSION BARS	31	LOADING NUTS
16	STIFFENING PLATE.		

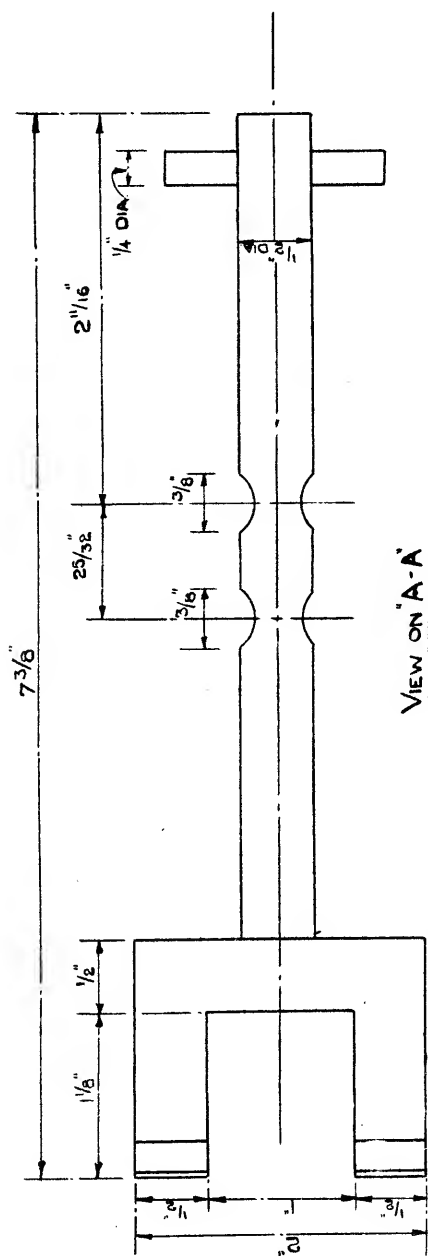


SPRING EXTRACTOR & INSERTING TOOL.

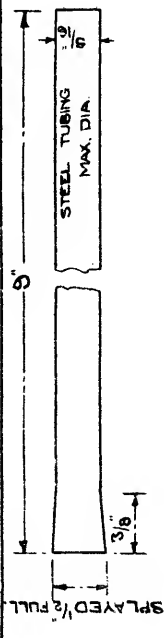
C.E. GHQ. H.F.
DRG. N°
518

LOAD TESTING MACHINE.

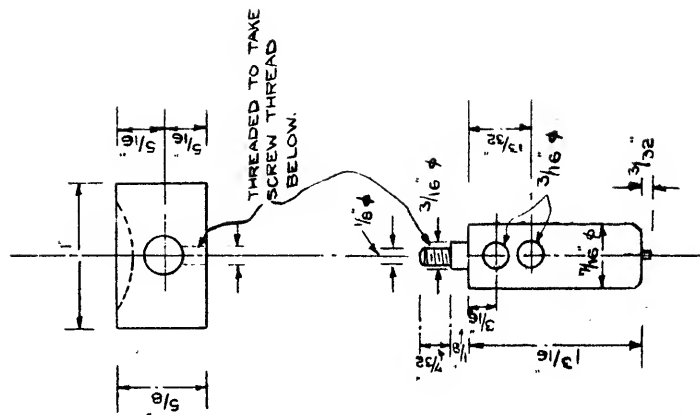
FIG. 184.



TESTING SAFETY ROD.
SCALE FULL SIZE.



TOOL, STRIKER INSERTING.
SCALE FULL SIZE.



TESTING STRIKER.
SCALE FULL SIZE.

FIG. 186
 GERMAN 10.5 CM. Q.F. S. SHELL.
 SCALE 1/2.

